

REMARKS

Attached hereto is a Request for an Extension of Time and the appropriate fee.

The present invention is directed to providing a relatively efficient and compact negative ion emitter which can use one or more titanium needle point emitters to produce a corona discharge for the creation of negative ions. The present invention utilizes a load resistance section of approximately 20 ohms to provide a predetermined voltage point in which the generation of the negative ions are enabled.

As disclosed in Figure 2, a plurality of needle point emitters each having a carbon load resistance section can be connected to a common load resistance section which is in turn connected to a high-voltage DC source. In this embodiment, a plurality of negatively charged electrons can be emitted from each of the respective needle point electrodes.

The present invention can provide the advantageous effects of negative ions emitted into the air in a relatively compact and efficient manner without the requirements of grids or other elaborate components that can increase the cost of such an ion emitter.

As can be appreciated, the present invention, as with most inventions, can use elements available to those skilled in the art and have arranged such elements in a cooperative manner that is not heretofore been available. The Office Action, however, contends that the Dagenhart U.S. Patent No. 4,531,077 anticipates Claims 1 and 17 and further renders Claims 2-16 and 18-20 obvious.

With regards to the obviousness rejection, the Office Action liberally asserts that certain features would be obvious to one of skill in this field. Applicant, without having a specific reference to review to determine the true state of teaching of such a reference in combination

with the Dagenhart reference is unable to adequately respond to such an assertion. Accordingly, applicant requests that if the present claims are not allowable, that such assertion of matters of common knowledge in the Office Action be shown in a cited reference in support of such a position in accordance with MPEP Section 706.02(a) (see also *ex parte Nouel*, 158 U.S.P.Q. 237, 239 (Board of Appeals 1968)).

The Dagenhart reference teaches a special form of ion generator of a modified calutron type wherein negative ions are produced by surface ionization by the bombardment of a converter plate with positive ions produced in an electron arc discharge column. Dagenhart specifically addressed the problem of heat and erosion that can cause the ion source to fail prematurely. As can be readily appreciated, a complex helium cooled converter plate utilizes cesium vapor to form ions in an arc discharge and to bombard a converter to produce H^{31} ions. This all occurs in a magnetic field with the collector plate biased at the anode potential due to the connection of a resistor between the collector plate and the housing. Basically, the resistor is of a value so that the collector plate will be self biased at essentially the filament voltage during the operation of the ion source. This provides a primary electron stream for an arc discharge forming from the plasma column by collision of the electrodes streaming through the collimating plate aperture and through the molecular species along the length of the plasma column.

The interpretation of the Office Action as to the relationship of a discharge electrode cited as element 103 in Figure 1 and the resistor cited as being located within the filament chamber 9 is certainly not operative in the manner set forth and described in our present claims. Applicant accordingly respectively traverses citing diverse elements simply because of a similarity in terminology rather than a similarity in function to provide the operative negative ion emitting apparatus of the present invention as defined in our claims.

The accelerating electrode 103 of Dagenhart is not used for emitting negative electrons therefrom. It is rather used for forcing the negative hydrogen ions H⁻ generated in the plasma ribbon 45 to pass quickly through the plasma ribbon and out through the discharge slit 33 formed in the housing 5. These negative hydrogen ions will pass through the opening 105 formed in the accelerating electrode 103. For this purpose, the accelerating electrode 103 is connected to a positive terminal of the power supply V_B (not to V_E) and is grounded so as to operate at a higher potential relative to the housing 5. Thus, electrode 103 is an accelerating electrode, not the discharge electrode of the present invention. Needless to say, the accelerating electrode could not function as a needle point electrode having at a distal end the capability of providing a corona discharge for producing negative charged electrons.

In addition, the resistor R referred to in the filament chamber 9 is disposed between a collector plate 67 connected to the anode 69 and the housing 5, rather than the accelerating electrode 103 and the power supply V_B. Dagenhart produces an electron stream arc generated in a magnetic field B due to a hot filament arc discharge using the filament 51 and the anode 69.

The present invention as defined in the claims uses a load resistance section arranged between the power supply section and the discharge electrode section. In addition, no positive electrode or anode is required. Instead, hydrogen ions that are contained in the moisture of ambient air and/or other positive ions contained in the atmosphere are used as a positive electrode so that a discharge occurs directly in the air. Thus, the present invention can achieve the objects and effects stated in the specification in a manner neither anticipated nor taught by the Dagenhart reference.

Applicants respectfully submit that there is no motivating force that can be found in the teachings of the prior art which would compel somebody of skill in this field to address and

solve the problem recognized by the present invention in the manner that is set forth in the presently pending claims. It is respectfully submitted that the examining procedure that requires the Examiner to first gain intimate knowledge of the invention can unexpectedly influence the Examiner in selecting and accumulating art to create a rejection. The zeal of the examination procedure must be tempered with an objective review of the art and what it would actually teach to a person of skill in the field.

See *W. L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.")

It is believed that the present case is now allowable and an early notification of the same is requested.

If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on November 8, 2002.


By: Barbara O'Neill

Barbara O'Neill
Signature

Dated: November 8, 2002

Sincerely yours,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims to read as follows:

1. (Amended) A negative ion emitting apparatus comprising:
a DC high-voltage power supply section;
at least one discharge electrode section connected to the DC high-voltage power supply section for emitting negatively charged electrons; and
at least one load resistance section arranged between said DC high-voltage power supply section and said discharge electrode section so as to restrict flowing of electrons from said DC high-voltage power supply section to said discharge electrode section until a predetermined voltage is applied.
3. (Amended) A negative ion emitting apparatus as defined in claim 1, wherein said discharge electrode section is constituted by a needle electrode formed at a distal end thereof with an acute angle to a longitudinal axis of the needle electrode.
4. (Amended) A negative ion emitting apparatus as defined in claim 2, wherein said discharge electrode section is constituted by a needle electrode [formed at a distal end thereof with an acute angle].
17. (Amended) A negative ion emitting method comprising the step of connecting at least one load resistance section between a DC high-voltage power supply section and at least one discharge electrode section, to thereby restrict flowing of electrons from said DC high-

voltage power supply section to said discharge electrode section for enabling an emission of negative ions from said discharge electrode section.

18. (Amended) A negative ion emitting apparatus as in [Claim] claim 3 wherein the load resistance section includes carbon having a resistance of 20 Ω and the DC high-voltage power supply section [can] to provide 5kV.

20. (Amended) A negative ion emitting apparatus as in [Claim] claim 19 wherein the respective carbon sections have a resistance of 20 Ω and the DC high-voltage power supply section [can provide] provides 5kV.

Please add new Claims 21 and 22.

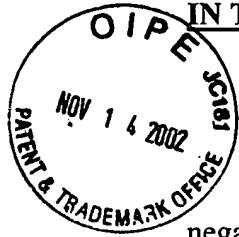
21. (New) A negative ion emitting apparatus comprising:
a DC high-voltage power supply section;
a first needle point metal electrode;
a first load resistance section including carbon of approximately 20 Ω connecting the DC high-voltage power supply section to limit the first needle point metal electrode from emitting negative ions until a predetermined voltage is applied by the DC high-voltage power supply section.

22. (New) A negative ion emitting apparatus as in Claim 21 wherein a second needle point metal electrode and a second load resistance section including carbon is connected to the DC high-voltage power supply section and a common load resistance section is connected to the respective first and second load resistance sections in series with the DC high-voltage power supply section.

IN THE ABSTRACT

Please amend the Abstract of the Disclosure to read as follows:

A negative ion emitting method and an apparatus therefor [capable of] for emitting negative ions with increased efficiency without generating ozone and positive ions while being simplified in structure. The apparatus includes a DC high-voltage power supply section and a discharge electrode section, between which a load resistance section is arranged so as to restrict flowing of electrons from the power supply section to the discharge electrode section.



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